

CLAIMS:

1. An audio/video system having an audio reproduction device (CU) for reproduction of audio signals via at least one loudspeaker unit (LSB1 – LSB5), and having ultrasonic signal-generating means (6) for generating ultrasonic signals (UT1 – UT3; UT4), wherein the ultrasonic signal-generating means (6) are designed to emit the ultrasonic signals to at least one of the loudspeaker units (LSB1 – LSB3), which at least one of the loudspeaker units (LSB1 – LSB3) is designed to emit the ultrasonic signals, and having ultrasonic signal-receiving means (5) for receiving ultrasonic signals (UR1 – UR3; UR4), and having ultrasonic signal-processing means (7) for processing ultrasonic signals received by the ultrasonic signal-receiving means (5), wherein the ultrasonic signal-processing means (7) are designed automatically to detect the presence of at least one person (1) from changes in the received ultrasonic signals (UR1 – UR3; UR4) and to emit a detection signal (DS).
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2. An audio/video system as claimed in claim 1, wherein the ultrasonic signal-processing means (7) are designed to detect at predetermined intervals echo patterns (signal 1, signal 2) of the ultrasonic signals (UR1 – UR3; UR4) received by the ultrasonic signal-receiving means (5) as single sequences over a pre-defined period of time and furthermore to compare the last detected echo pattern (signal 2) with at least one echo pattern detected earlier (signal 1) in order to detect the presence of at least one person (1) from changes in the echo pattern.
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3. An audio/video system as claimed in claim 2, wherein the ultrasonic signal-processing means (7) are designed to subdivide each detected echo pattern (signal 1, signal 2) into a number of time slots (TS1 to TS64) and to compare, time slot by time slot, the signal sequences of the echo patterns or parameters to be determined from the echo patterns, such as an average amplitude thereof, in order to detect the presence of at least one person from changes therein.
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4. An audio/video system as claimed in claim 3, wherein, through detection of those echo signal time slots (TS63) in which changes were detected, the ultrasonic signal-

processing means (7) are designed to determine the distance covered by the ultrasonic signal from its emission via reflection against an object to its arrival at the ultrasonic signal-receiving means (5).

- 5 5. An audio/video system as claimed in claim 1, wherein the ultrasonic signal-processing means (7) are designed to determine frequency shifts from the ultrasonic signals (UR1 – UR3; UR4) received by the ultrasonic signal-receiving means (5), in order to detect the presence of at least one moving person from the frequency shifts.
- 10 6. An audio/video system as claimed in claim 5, wherein the ultrasonic signal-processing means (7) are designed to subdivide the received ultrasonic signals into a plurality of frequency bands and, upon detection of frequency shifts, to take into account only those frequency bands whose signals exceed a level having a pre-defined value.
- 15 7. An audio/video system as claimed in claim 5, wherein the ultrasonic signal-processing means (7) are designed to determine the position and the speed of movement of at least one person from the frequency shifts of the received ultrasonic signals on the basis of the Doppler effect, which frequency shifts are detected by the ultrasonic signal-receiving means (5).
- 20 8. An audio/video system as claimed in claim 1, wherein the ultrasonic signal-receiving means (5) are in the form of a microphone, preferably in the form of a capacitor microphone.
- 25 9. An audio/video system as claimed in claim 1, wherein each loudspeaker unit (LSB1, LSB3), via which loudspeaker unit (LSB1, LSB3) ultrasonic signals are transmittable, comprises a tweeter loudspeaker (8) having a frequency response extending into the respective ultrasonic range.
- 30 10. An audio/video system as claimed in claim 1, wherein the audio/video system is designed to prepare a user profile by recording user actions, such as the operation of control devices on the audio reproduction device, for example the implementation of sound settings or the selection of specific radio stations, etc., preferably with concomitant recording

of a time reference, in order to carry out the actions recorded in the user profile automatically when the detection signal (DS) is generated by the ultrasonic signal-processing means (7).

11. An audio/video system as claimed in claim 10, wherein preparation of the user
5 profile comprises the correlation of the recorded user actions with one another in order to obtain an improved user profile from the correlated data.

12. An audio/video system as claimed in claim 1, wherein the detection signals (DS) output by the ultrasonic signal-processing means (7) are designed to activate an alarm
10 device (9).

13. An audio/video system as claimed in claim 12, wherein the detection signals (DS) are designed to be transmitted via a telecommunications network (10) to an alarm station.

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14. An audio/video system as claimed in claim 1, wherein the ultrasonic signal-generating means (6) are designed to emit ultrasonic signals via at least two loudspeaker units (LSB1, LSB3), and wherein the ultrasonic signal-processing means (7) are designed to determine the position of at least one person (1) present from the received ultrasonic signals (UR3; UR4) and to emit position information by way of the detection signals (DS), and wherein the audio reproduction device (CU) is designed to adjust a favorable setting of the reproduction parameters of the individual audio channels on the basis of the detection signals (DS).

25 15. An audio/video system as claimed in claim 14, wherein a favorable setting of the volume (balance) of the individual audio channels is determined from the detection signals (DS).

30 16. An audio/video system as claimed in claim 14, wherein a favorable setting of the propagation delays (delay) of the individual audio channels is determined from the detection signals (DS).

17. An audio/video system as claimed in claim 14, wherein a favorable setting of the frequency characteristics of the individual audio channels is determined from the detection signals (DS).
- 5 18. An audio/video system as claimed in claim 14, wherein a favorable setting of the mechanical position of the individual loudspeaker units is determined from the detection signals (DS).
- 10 19. An audio/video system as claimed in claim 1, wherein the ultrasonic signal-processing means (7) are designed automatically to determine the location of at least one person (1) from changes in the received ultrasonic signals (UR1 – UR3; UR4), and to output location information in the detection signal (DS).